

# DS ASSIGNMENT NO: 3

## Load Balancing

Name:- Aagam Gadiya

PRN :- B24CE1118

Date:-

### CODE

```
#include<iostream>
using namespace std;

int m#include <iostream>
#include <vector>
using namespace std;

int main() {
    int servers;
    cout << "Enter number of servers: ";
    cin >> servers;

    // Vector of vectors to store multiple requests per server
    vector<vector<int>> hash_servers(servers);

    int req;
    cout << "Enter number of requests: ";
    cin >> req;

    vector<int> val(req);

    // Input request IDs
    for (int i = 0; i < req; i++) {
        cout << "Enter request ID (or client IP as number): ";
        cin >> val[i];
    }

    // Assign requests to servers using modulo hash
    for (int j = 0; j < req; j++) {
        int hash_val = val[j] % servers; // server index
        hash_servers[hash_val].push_back(val[j]);
    }
```

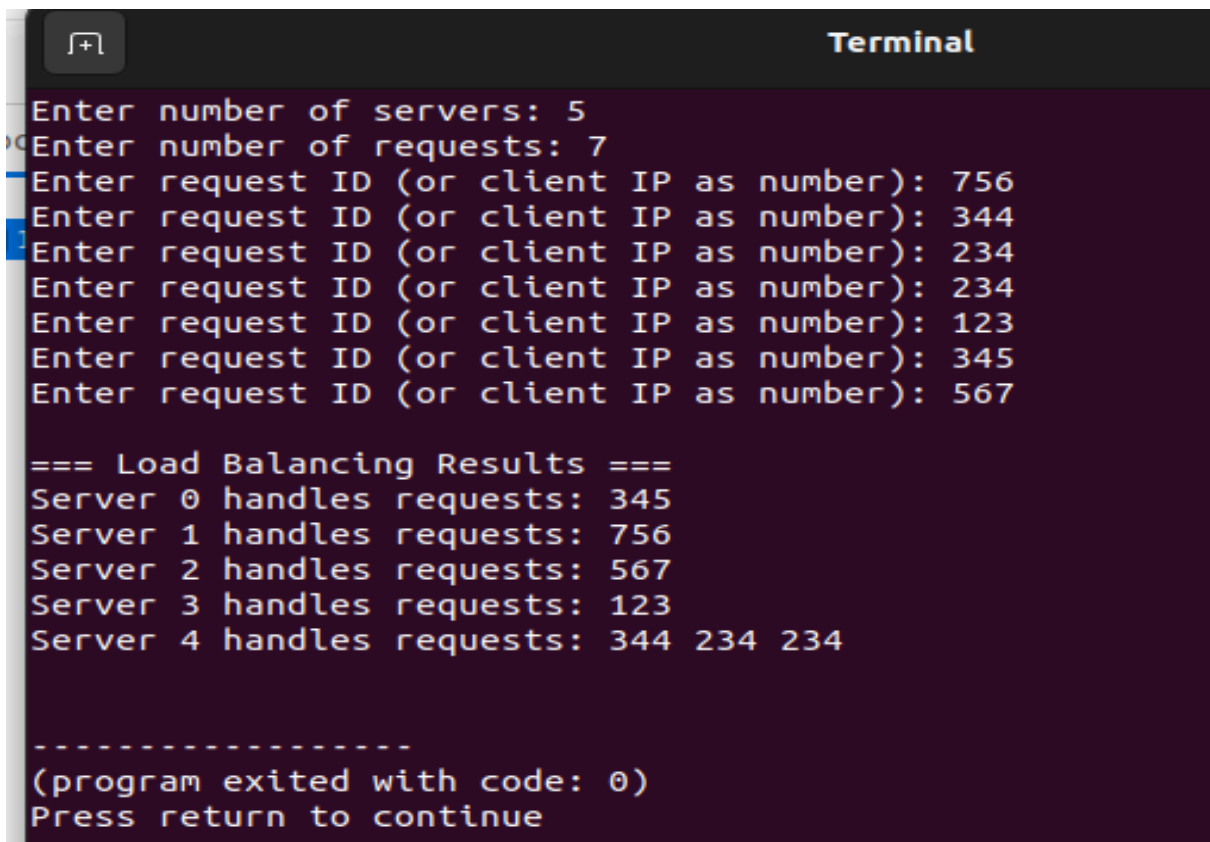
```

// Output load distribution
cout << "\n=== Load Balancing Results ===\n";
for (int k = 0; k < servers; k++) {
    cout << "Server " << k << " handles requests: ";
    if (hash_servers[k].empty()) {
        cout << "None";
    } else {
        for (int req_id : hash_servers[k]) {
            cout << req_id << " ";
        }
    }
    cout << endl;
}

return 0;
}

```

## OUTPUT



A terminal window titled "Terminal" with a dark background and light-colored text. It shows the execution of a C++ program. The user enters 5 for the number of servers and 7 for the number of requests. Then, they enter 7 request IDs: 756, 344, 234, 234, 123, 345, and 567. The program outputs the load distribution for each server. Server 0 handles request 345. Server 1 handles request 756. Server 2 handles request 567. Server 3 handles request 123. Server 4 handles requests 344, 234, and 234. The program then exits with code 0, and the user is prompted to press return to continue.

```

Terminal
Enter number of servers: 5
Enter number of requests: 7
Enter request ID (or client IP as number): 756
Enter request ID (or client IP as number): 344
Enter request ID (or client IP as number): 234
Enter request ID (or client IP as number): 234
Enter request ID (or client IP as number): 123
Enter request ID (or client IP as number): 345
Enter request ID (or client IP as number): 567

=== Load Balancing Results ===
Server 0 handles requests: 345
Server 1 handles requests: 756
Server 2 handles requests: 567
Server 3 handles requests: 123
Server 4 handles requests: 344 234 234

-----
(program exited with code: 0)
Press return to continue

```